

NON-PUBLIC?: N
ACCESSION #: 8802020288

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Turkey Point Unit 3 PAGE: 1 of 3

DOCKET NUMBER: 05000250

TITLE: Manual Reactor Trip From 70% Reactor Power Due to Loss of Turbine
Generator Electrical Load

EVENT DATE: 12/29/87 LER #: 87-034-00 REPORT DATE: 01/28/88

OPERATING MODE: 1 POWER LEVEL: 070

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10
CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Randall D. Hart, Licensing Engineer TELEPHONE #: 305-246-6559

COMPONENT FAILURE DESCRIPTION:

CAUSE: X SYSTEM: IT COMPONENT: RLY MANUFACTURER: W120
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On December 29, 1987, Unit 3 experienced a reactor trip from approximately 70% reactor power. The reactor control operator (RCO) began a load increase on unit 3 from 50% power to 75% power at a ramp rate of approximately 3% per hour. Various secondary alarms came in for turbine overspeed protection, and for generator anti-motoring trip. The RCO immediately noticed that the turbine generator electrical load had dropped to approximately 24 megawatts (MW) electrical and the load limit on the turbine generator was indicating approximately 1 pound per square inch (psi) with no appreciable decrease in reactor power. At this time the Plant Supervisor - Nuclear (PSN) authorized a manual reactor trip which was completed by the RCO. The reactor trip occurred as designed and the plant was stabilized in mode 3 (hot standby). An event response team (ERT) was formed to review this event to assist in determining the root cause and corrective actions. The root cause for the loss of turbine load was stuck contacts on the overspeed controller 20% underpower relay. The relay contacts were freed and cleaned. The inputs to the relay were satisfactorily calibrated. Upon completion of the post trip review and appropriate maintenance, the unit was returned

to service on December 31, 1987.

(End of Abstract)

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EVENT:

On December 29, 1987, at 1438, Unit 3 experienced a reactor trip from approximately 70% reactor power. At 0615 the reactor control operator began a load increase for Unit 3 from 50% power to 75% power at a ramp rate of approximately 3% per hour. At 1438, various secondary alarms came in for turbine overspeed protection (EHS:IT), and for generator anti-motoring trip. The RCO immediately noticed that the turbine generator (EHS:TA) electrical load had dropped to approximately 24 megawatts (MW) electrical and the load limit on the turbine generator was indicating approximately 1 pound per square inch (psi) with no appreciable decrease in reactor power. At this time the Plant Supervisor (Nuclear (PSN) authorized a manual reactor trip which was completed by the RCO. The reactor trip occurred as designed and the plant was stabilized in mode 3 (hot standby). An event response team (ERT) was formed to review this event to assist in determining the root cause and corrective actions.

CAUSE OF EVENT:

An investigation found the overspeed protection controller (OPC) 20% underpower relay (237/G3) failed with its contacts stuck. The OPC is a device which senses a sudden loss in load and closes the control valves and intercept valves before the turbine speed rises. The OPC uses the low pressure turbine steam pressure, PS-3639, and a power sensing relay connected to a potential and current transformer on the main generator. The controller receives a signal from both of these and compares them to determine if any potential overspeed condition exists. With the low pressure turbine steam pressure above 50% and an electrical load of less than 20% the controller will supply a protective signal which opens solenoid valve SV 20 OPC to dump control oil (EHS:TG), thereby closing the intercept and control valves, preventing the turbine from overspeeding.

Therefore, when power increased above 50% steam flow on PS-3639, the stuck contacts on 237/G3 actuated turbine overspeed protection and dumped control oil. This caused electrical load to decrease to approximately 24 MW electric. In anticipation of a generator trip and subsequent turbine/reactor trip, a manual reactor trip was performed.

ANALYSIS OF EVENT:

A post trip review was performed to assess the proper operation of the safety related equipment. The post trip review established that the transient behavior of pertinent plant parameters for the reactor cooling system (RCS) and steam generators (SG) responded as expected for a transient of this kind. Specifically, the RCS pressures and temperatures were determined to have followed an expected pattern based on the conditions leading up to the transient. Other than the manual reactor trip, there were no manual or automatic reactor protection system or engineered safety features actuations. The shift technical advisor (STA) performed a critical safety function (CSF) status tree evaluation which indicated the parameters were within

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specifications. Based on the above, the health and safety of the public were not affected.

CORRECTIVE ACTIONS:

- 1) An event response team was formed to review the event to assist in evaluating the root cause and providing corrective actions.
- 2) The contacts for relay 237/G3 were freed by hand and cleaned. Then the inputs to the relay were satisfactorily calibrated in accordance with preventative maintenance procedure 3-PMR-089.1, Turbine Overspeed Power Relay 237/G3 Calibration.
- 3) The similar relay on Unit 4 will be inspected and cleaned during the next outage of sufficient duration.
- 4) PS-3639 was inspected and calibrated in accordance with preventative maintenance procedure 3-PMI-089.3, Turbine Overspeed Protection System Instrumentation Channel P-3-3639 Calibration. No problems were found and no adjustments were made.
- 5) General operating procedures (GOPs) 3(4)-GOP-301, Hot Standby to Power Operation, were revised to require that the turbine overspeed protection amber 20% Load light is out when reactor power is above 45%.
- 6) Upon completion of the post trip review and scheduled maintenance activities, the unit was placed back on the line at 1049 on December 31, 1987.

ADDITIONAL DETAILS:

The turbine governor manufacturer is Westinghouse, serial number 13-A-2893.

Similar occurrences: LERs 250-86-039, 250-87-009 and 250-87-010 discuss reactor trips due to loss of turbine load. However, the root cause for those LERs is different from this occurrence.

ATTACHMENT # 1 TO ANO # 8802020288 PAGE: 1 of 1

P.O. BOX 14000, JUNO BEACH, FL 33408-0420
FPL
JANUARY 28 1988
L-88-46
10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 87-34
Date of Event: December 29, 1987
Manual Reactor Trip From 70% Reactor Power
Due to Loss of Turbine Generator Electrical Load

The attached Licensee Event Report (LER) is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,
/s/ J. W. Dickey for
C. O. Woody
Executive Vice President

COW/SDF/gp
Attachment
cc: Dr. J. Nelson Grace, Regional Administrator,
Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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